SECTION VI. REACTIVITY DATA

Stability	Stable	X	Conditions to avoid:
	Unstable		
Incompatibility (Materials to Avoid)	Petroleum solvents, plasticizers.		
Hazardous decomposition products:	Carbon dioxide, carbon monoxide, hydrogen chloride, hydrocarbon gases		
Hazardous Polymerization:	May occur		Conditions to avoid:
	Will not occur	X	

SECTION VII. SPILL, LEAK, AND DISPOSAL PROCEDURES

SPILLS, LEAKS: (Steps to be taken) No special precautions required

WASTE DISPOSAL METHOD: Approved land fill

SECTION VIII. SPECIAL PROTECTION INFORMATION

Respiratory protection (Specify Type)

Not required

Ventilation: Use adequate ventilation	Local Exhaust	Special
	Mechanical (General)	Other

Protective gloves: NA	Eye Protection: Use safety glasses if eye contact is possible.

Other protective equipment and precautions: NA

SECTION IX. SPECIAL PRECAUTIONS AND COMMENTS

Storage & Handling information: Store in a cool, well ventilated area

Other Precautions: Do not ingest

DOT Class: NA

Hazard Identity

Judgements as to the suitability of information herein for purchaser's purposes are necessarily purchaser's responsibility. Therefore, although reasonable care has been taken in the preparation of such information, Parker Hite Products, Inc. extends no warranties, makes no representations and assumes no responsibility as to accuracy or suitability of such information for application to purchaser's intended purposes or for consequences of its use

Signed Cynthia Hubbard

Title Director of Quality Control

FORM NO. 2317

---END---

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PHIFER WIRE PRODUCTS, INC.
P. O. BOX 1700 • TUSCALOOSA, ALABAMA 35403-1700 U.S.A.

CHARLES E. MORGAN
Executive Vice President and Corporate Counsel

February 5, 1997

Ms. Judith Hayes
Compliance Officer
U.S. Consumer Product Safety Commission
4330 East West Highway, Room 613
Bethesda, MD 20814-4408

Re: CPSC CA930075
Phifer Wire Products, Inc.
Polymer (PVC) Coated Fiberglass Screening

Dear Ms. Hayes:

Along with several other employees here at Phifer Wire, I have been looking through our files to find the information with which to answer your questions regarding our screen replacement program.

The replacement program began in an informal way in 1989, as soon as we realized that some of the screening we had produced after January 1988 was not performing as it should. Phifer Wire had little experience in dealing with product failures before that time. The program evolved through the years as necessary to respond to the problem.

During the first few years, there was no formal written replacement program. If a consumer or apartment manager reported discolored screening, we would ask our distributor, or the dealer or contractor who had installed the screening, to replace it without charging the homeowner. We would then give our distributor a credit equal to the total cost (materials and labor) of rescreening the job. This became complicated as the number of claims increased with several levels of distribution involved (manufacturer-distributor-dealer-contractor), so we began directly paying the dealer or contractor who did the screen replacement.

Some of our basic insect screening was (and still is) sold without written warranties of any kind. Our SunScreen® solar screening has a five-year written warranty, but it covers material only and not the labor costs related to the replacement. Nevertheless, since we determined that some of the 1988-89 material had a latent defect that could not be detected at the time of installation, we decided to make our customers and their customers completely whole by reimbursing the full cost of the labor and materials needed to replace the discolored screening.

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The earliest written record I found of our replacement program is the enclosed document (that I have marked "EXHIBIT A") titled "DEFECTIVE SUNSCREEN REPLACEMENT PROGRAM." That program outline was given to our distributors in the southwest (where most SunScreen is sold) beginning in 1992 or 1993. Along with those guidelines, distributors were given the enclosed "DEFECTIVE SUNSCREEN REPLACEMENT CLAIM" form that I have marked "EXHIBIT B."

After the screen problem and the replacement program were widely publicized via television in 1993, we distributed "CONSUMER INSPECTION REQUEST CARDS" for our customers to give to consumers. Please see enclosed "EXHIBIT C."

Although our screen replacement program was not pre-organized as well as it might have been if we had had previous experience, we were still able to identify and replace discolored screening for thousands of consumers before the expiration of the normal useful life (about five years) of the product. Between 1989 and the end of 1996, Phifer Wire spent well over two million dollars on screen replacements.

Phifer Wire has received no product liability claims of any kind since our last supplemental response. If you need additional information, please let me know.

Sincerely yours,

PHIFER WIRE PRODUCTS, INC.

Charles Morgan

Charles Morgan

CM:jh

Enclosures

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EXHIBIT A

DEFECTIVE SUNSCREEN REPLACEMENT PROGRAM

Phifer Wire Products, Inc. will pay SunScreen Dealers $2.36/square foot for the replacement of defective SunScreen material, in accordance with the defective sample provided by Phifer Wire Products. For the Dealer to be reimbursed the following procedures must be taken:

1. Dealer must fill out the Defective SunScreen Replacement Claim Form (Provided by Phifer Wire)

2. The Dealer is to mail the completed and signed Defective SunScreen Replacement Form to:

   Phifer Western
   14408 East Nelson Avenue
   City of Industry, CA 91744

3. Phifer will inspect defective SunScreen material at the job sites on the second and fourth Monday and Tuesday of each month.

4. After inspection, Phifer will approve or deny the replacement claim. If approved, the dealer will be given the approved replacement form and can proceed with the replacement of the defective SunScreen.

5. After completion of the installation of replacement material, dealer will attach the invoice to the warranty claim form and mail it back to Phifer Western at the above address. The invoice must reflect total square footage, color, number of screens and sizes used to replace defective material.

6. Once Phifer receives this information, Phifer will do the post inspection to determine that the material has been replaced.

7. After approved post inspection, Phifer will send the warranty claim form with attached invoice to Phifer Wire Products Corporate Headquarters for payment.

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EXHIBIT B

DATE OF CLAIM: _____

DEFECTIVE SUNSCREEN REPLACEMENT CLAIM

1. Dealer's Name: _____ Fed. ID # _____
   Contact: _____
   Address: _____
   City: _____ State: ____ Zip: _____
   Phone: _____

2. Customer's Name: _____
   Address: _____
   City: _____ State: ____ Zip: _____
   Phone: _____

I, the undersigned, do hereby affirm that the material in the above mentioned application is defective according to the sample provided by Phifer Wire Products, Inc. This material was originally installed by: _____ Date: _____

_____ _____
Signed Date

4. PRE-INSPECTED BY: _____ DATE: _____

5. Total Square Footage and Color of Material Replaced: _____

_____

6. POST-INSPECTED BY: _____ DATE: _____

COMMENTS: _____

_____

_____

_____

_____

_____

_____

_____

NO POSTAGE
NECESSARY
IF MAILED
IN THE
UNITED STATES

BUSINESS REPLY MAIL
FIRST CLASS MAIL PERMIT NO. 22 TUSCALOOSA, ALABAMA

POSTAGE WILL BE PAID BY ADDRESSEE

PHIFER WIRE PRODUCTS INC
ATTN ALAN GRAY
P O BOX 1700
TUSCALOOSA AL 35403-1700

CONSUMER INSPECTION REQUEST CARD

1. Who installed your fiberglass screens?_____
2. When were your screens installed?_____
3. If your screen was in place when you purchased your home and you do not know the answers to questions 1 & 2, when was your home built and by whom? DATE: _____ BUILDER: _____
4. When did you first realize there might be a problem with your screens?
   _____
5. What day and hour would be convenient for us to phone you to schedule an appointment to inspect your fiberglass screens?_____
6. Your Name: _____
   Address: _____
   _____
   Phone No.: _____

EXHIBIT C

FAX COVER SHEET

TO: Judith Hayes

FAX NO: 301/504-0359

DATE: Feb. 6, 1997

TOTAL PAGES: 6

FROM:

Charles Morgan
Phifer Wire Products, Inc.
P. O. Box 1700
Tuscaloosa, AL 35403-1700

TELEPHONE: 205/750-4757
or 205/345-2120

FAX NO: 205/750-3022

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Attention: Patricia Atkins
Fax # 301-504-0768

Total page = 3

From: Mary Golarz
Fax # 810-391-0062
Phone # 810-391-1675

Jan 31, 1997

Dear Mrs. Atkins,

There are (4) more families I know of that received "METAL" screens as replacement for their original in the year 1996.

The 2 letters are from a family with health effects: William + Melinda DePlanty
5625 Gardner Rd
Metamora 48455 Phone 810-969-0175

The following families gave their permission to also pass their names on to officials of the government

1) Donald + Gail Pygman
6831 Deer Valley Dr
Clarkston, MI 48348
Phone 810-391-5141
(Received "metal" screens sometime after the T.V. Media Coverage in MI + AZ in 1993)

2) Michael + Mary Anne Kennon
6539 Deer Valley Dr
Clarkston, MI 48348
Phone 810-391-4887
(Received "Metal" screens in 1994)

Sincerely,
Mary Golarz
810-391-1675

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1/16/97

To Whom it may concern

October 1993 We purchased a new home in Metamora Michigan. After moving in the kids were sick more often than in our other house, Allergies seemed to pop up all of the sudden they seemed more sensitive to everything around them. We are in a very rural environment more so than before. We have had the screens in our home replaced this past summer. The kids seem to be feeling better overall. Hopefully this was the problem or if not all, then some of it. We will be available in the future for more information. This will be our first full summer coming up with the new screens.

Sincerely

Mike & Christine Golarz
5625 Gardner Rd
Metamora Mich 48455
1-810-969-0175

Husband to Melinda Image

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To Whom it may concern:

I have experienced head aches, sleeplessness, loss of concentration, frequent urination and was more irritable when we had the screens. I can't be one hundred percent sure that it is the screens but I am glad that these signs have subsided with Our new screens. My son Brandon has had allergies, asthma, and now seems much better. My son Dayne would always wake up in the night and have to sleep with us. My daughter Rachelle would throw tantrums for no reason, she would always have swollen glands and usually a cold or upper respiratory problems. My husband Bill has sleep apnia and had always seemed stressed but seems better now with our new screens.

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Melinda Y DePlacenty
5625 Gardner Rd Metamora MI 48455
810-969-0175

provided by P. Adkins

1-20-97
TO: Dr. MILTON CLARK-EPA
FROM: Lisa Kelley
phone# 1-810-391-6227 fax#1-810-391-4434

I am writing to you in the hope that you will view a particular consumer problem to be as important as I do. I'm writing about indoor air pollution that could occur as a result of V.O.C. off gassing from defective window screens. I am also concerned about the health effects of long term and low dose exposure to the chemicals.

I had noticed an odd "hot" odor (especially in sunny rooms) and the development of various health problems shortly after we moved into this home.The problems persisted for some time before I heard that some neighbors experienced similar problems and had traced the source to the window screens! Most of the homes in our subdivision were built around the same time. Many of the homes, like ours, have some casement windows that place the screens on the inside of the home. As we did, many others left their screens up all year. After I learned people had been getting their defective screens replaced, I had ours replaced. My first set of replacement screens had the same odd odor. Phifer has replaced my original screens 4 times, with fiberglass and coated aluminum screens. I now have uncoated stainless steel screens. People are still requesting that their screens be replaced. Complaints, claims, and lawsuits continue to be filed.

In my case the problems included headaches, arthritis, inflammation,increase in sinus problems,tingling from hands and feet, cysts, mouth sores, dermatitis, elevated titers for Lyme, CMV, chlamydia, fatigue, abnormal immunoglobulin tests, and positive ANA tests. The ANA gradually went down and subsequently became negative after the last set of coated screens were removed from my home. My 12 year old daughter had repeated stomach aches that did decrease after the final coated screen removal, but has continued to have various joint problems,low blood sugar readings, rapid heartbeat, abnormal immunoglobulin tests, and has been hospitalized twice in the last year for infection with high fever and dehydration. My 9 year old son had repeated ear infections that wouldn't clear up with antibiotics but did finally resolve after the final coated screen removal. He has continued to have some occasional ear problems. My husband was having repeated problems with achiness, nausea and irritated bloodshot eyes. He continues to have some problems at this time.

Detroit and Phoenix area news stations aired stories about this problem in April/May of 1993. The CPSC did create a file on the Phifer Wire Products screens. The file was closed after Phifer explained a program to "Locate and Replace" the defective material. While Phifer, to my knowledge, has often agreed to replace screens for consumers who contact them with concerns, I am not sure what effort has been put forth to locate other defective material. So, of course, I worry about homes where the product is still in place and could be causing problems. How will families be made aware of this problem? I am also concerned about those who may not be able to associate their health problems or odd odors with their screens.

STATE OF MICHIGAN

JOHN ENGLER, Governor

DEPARTMENT OF COMMUNITY HEALTH
JAMES K. HAVEMAN, JR., Director

COMMUNITY PUBLIC HEALTH AGENCY

3423 N. MARTIN L. KING JR. BVLD.
PO BOX 30195
LANSING, MI 48909

January 21, 1997

Ms. Judith Hays
Consumer Product Safety Commission
Room 613
4330 East-West Highway
Bethesda, Maryland 20814

Dear Ms. Hays:

Subject: Vinyl coated window screens

This follows our telephone conversation of January 16, 1997 and earlier discussions and correspondence with Consumer Product Safety Commission staff. We have received health complaints from the following Michigan residents who have used certain kinds of vinyl coated window screens in their homes more recently than 1990. The citizens have complained of having irritation of eyes, nose, and the respiratory tract, as well as other health problems, which they believe were caused by the indoor air contaminants allegedly released by the window screens.

1. Linda Faught
   6950 Patrick Court
   Clarkston MI 48346
   Telephone 810-625-9419

2. Kelley Keffer-Marsh
   6351 Paramus
   Clarkston MI 48346
   Telephone 810-625-9263

3. Robert Freer
   P.O. Box 549
   Harrisville MI 48740
   Telephone 517-724-6241

Besides these, I also list below the names and addresses of the community lead persons who are well informed with this problem.

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1. Mary Golarz
   6710 Sun Valley Drive
   Clarkston MI 48348
   Telephone 810-391-1675

2. Lisa Kelly
   6600 Sun Valley Drive
   Clarkston MI 48348
   Telephone 810-391-6227

I hope CPSC will continue to investigate and study this problem. I sincerely look forward to hearing from you.

Yours sincerely,

Kirpal S. Sidhu

Kirpal S. Sidhu, Ph.D., Toxicologist
Environmental Epidemiology Division
Telephone 517-335-8362

cc: J. Hesse
H. Humphrey
M. Golarz
L. Kelly

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PHIFER WIRE PRODUCTS, INC.
P. O. BOX 1700 • TUSCALOOSA, ALABAMA 35403-1700 U.S.A.

■ CHARLES E. MORGAN
Executive Vice President and Corporate Counsel

November 25, 1996

Ms. Judith Hayes
Compliance Officer
U.S. Consumer Product Safety Commission
4330 East West Highway, Room 613
Bethesda, MD 20814-4408

Re: CPSC CA930075
Phifer Wire Products, Inc.
Polymer (PVC) Coated Fiberglass Screening

Dear Ms. Hayes:

As I mentioned to you in our last telephone conversation, Phifer Wire has recently had comprehensive emissions testing and analysis performed by Air Quality Sciences, Inc. on a sample of our current production fiberglass screening. They tested a recently manufactured nine square foot sample of our screening that had never been exposed to direct sunlight - exactly like the sample I sent to you with my October 30, 1996 letter. Enclosed is a complete copy of the Air Quality Sciences report on the results of that testing. The document is titled "INDOOR AIR QUALITY EVALUATION OF NEW VINYL COATED FIBERGLASS WINDOW SCREENING" and is dated November 19, 1996.

The results of the recently completed tests are consistent with the results of previous testing of our products in that they show no emissions of any substances in concentrations that could be considered toxic or potentially harmful to human beings. The enclosed report represents the most comprehensive testing and analysis of our product ever completed. The results of the tests were used to predict air concentrations of the various chemicals identified using models based upon average sized homes with average numbers of windows. The concentrations determined through the testing were compared with guidelines and specifications published by the American Congress of Governmental Industrial Hygienics, permissible exposure limits (PEL) from the Occupational Safety and Health Administration (OSHA), a German government regulation for maximum allowable workplace concentrations (MAK), and specifications from the State of Washington Indoor Air Quality Program. In all cases, emissions of TVOCs, formaldehyde and particles from our product were far below permissible levels set out in the various guidelines, specifications and regulations.

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We included the comparison with the German government regulations because we sell a lot of this product in Europe, especially in Germany. We included the comparison with the State of Washington specifications because that Indoor Air Quality Program is considered the most progressive, comprehensive and strictest set of guidelines specifying acceptable levels of product emissions from building materials. Our consultant tells me that the program developed in the State of Washington is now being copied by several other states and will likely be copied by the U.S. Environmental Protection Agency as it develops its standards for indoor air quality. For a product to be acceptable for use in any government building in the State of Washington, the product must fall below the TVOC, formaldehyde and particles specifications within five days of exposure. As the enclosed report indicates, the sample of our current production material emitted far less TVOCs, formaldehyde and particles than the Washington specifications within just four hours of exposure and throughout the 96-hour testing period.

Please note that these tests were conducted at higher temperatures than in the previous Air Quality Sciences test - approximately 70° Celsius, which is the equivalent of 158° F. Heating the product to such high temperature will undoubtedly drive off more chemicals than would be emitted under normal household conditions.

I hope the enclosed data will help you in evaluating the safeness of our product. If you ever need additional information, please feel free to contact me at any time.

Sincerely yours,

PHIFER WIRE PRODUCTS, INC.

Charles Morgan

Charles Morgan

CM:jh

Enclosure

INDOOR AIR QUALITY EVALUATION OF A NEW VINYL COATED FIBERGLASS WINDOW SCREENING

prepared for

PHIFER WIRE PRODUCTS, INC.

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Released by Air Quality Sciences, Inc.
AQS Report No. 02792-02
November 19, 1996

AIR QUALITY SCIENCES, INC. 1337 Capital Circle Atlanta, Georgia 30067 770-933-0638 • Fax 770-933-0641

Released by Air Quality Sciences, Inc.
Date Prepared: November 19, 1996
AQS Project #: 02792
AQS Report #: 02792-02

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Released by Air Quality Sciences, Inc.
Date Prepared: November 19, 1996
AQS Project #: 02792
AQS Report #: 02792-02

EXECUTIVE SUMMARY

PROJECT DESCRIPTION

Air Quality Sciences, Inc. (AQS) is pleased to present the results of its indoor air evaluation of a screen sample identified as "New Vinyl Coated Fiberglass Window Screening" for Phifer Wire Products, Inc. AQS conducted this study using a product evaluation test protocol following the requirements of ASTM Standard D 5116 and the State of Washington's IAQ Specification of January, 1994 (1,2). Testing of the screen was conducted using elevated environmental chamber operating conditions as presented in Table 1.

The sample was monitored for emissions of total volatile organic compounds (TVOC), formaldehyde (HCHO), other individual volatile organic compounds (VOCs), and particles over a 96 hour exposure period. These emissions were measured, and resultant air concentrations were determined for each of the potential pollutants. Air concentration predictions were computer modeled based on product use parameters provided by the customer. Results were compared with the State of Washington specifications, occupational exposure levels, and various regulatory lists.

RESULTS

Emission factors were measured over a 96 hour exposure period for formaldehyde, TVOC, and particles. These data and predicted air concentrations are given in Tables 2-4. Detected individual volatile organic compounds (VOCs) are listed in Table 5. This product met the State of Washington specification for TVOC, formaldehyde, and particles within 4 hours of exposure.

Air concentrations were predicted to range from 401 $\mu g/m^3$ to 6 $\mu g/m^3$ for TVOC; this concentration fell below the 500 $\mu g/m^3$ TVOC specification within 4 hours of being installed in the chamber. The TVOC emission profile is presented in Figure 1. Maximum and minimum contaminant levels are compared to the State of Washington requirements in Table 6. Acceptable contamination levels were met within the required 5 day period.

Those chemicals found on certain regulatory lists are shown in Table 7. It must be noted that these regulatory lists only provide a statement regarding possible health effects associated with these compounds, and do not provide information on the relative risks of exposure. Proper interpretation of the risks associated with exposure to a given regulated compound requires a more detailed evaluation of toxicological activity.

Individual compounds identified in the test sample emissions were compared to occupational levels, including threshold limit values (TLV) from American Congress of Governmental Industrial Hygientics (ACGIH), permissible exposure limits (PEL) from the Occupational Safety and Health Administration (OSHA), and Federal Republic of Germany Maximum Concentration Values in the Workplace (MAKs). Those compounds identified on these lists are compared to the exposure levels in Table 8, along with the maximum predicted exposure concentration from the measured emissions data and the parameters provided by the customer. None of the occupational levels would be predicted to be exceeded under these conditions. Table 9 shows the predicted concentrations over 96 hours for these contaminants.

Released by Air Quality Sciences, Inc.
Date Prepared: November 19, 1996
AQS Project #: 02792
AQS Report #: 02792-02

PRODUCT EVALUATION METHODOLOGIES

ENVIRONMENTAL CHAMBER

The screen was tested in an environmental chamber and chemical emissions were analytically measured. Environmental chamber operation and control measures used in this study complied with ASTM D 5116 (1). The chamber used is manufactured from stainless steel, and its interior is polished to a mirror-like finish to minimize contaminant adsorption. Air flow through the chamber enters and exits through an aerodynamically designed air distribution manifold also manufactured of stainless steel. Supply air to the chamber is stripped of formaldehyde, VOCs, and other contaminants, so that any contaminant backgrounds present in the empty chamber fall below strict specifications (< 2 $\mu g/m^3$ TVOC, < 10 $\mu g/m^3$ total particles, < 6 $\mu g/m^3$ formaldehyde). AQS chambers are process controlled and are equipped with a continuous data acquisition system for verification of the operating conditions of air flow, temperature, and humidity.

Air supply to the chamber was maintained at a temperature of 70°C ± 2°C and relative humidity at 5% ± 3%. The air exchange rate was 1 air change/hour (ACH). Environmental chamber study parameters are presented in Table 1.

ANALYTICAL MEASUREMENTS

Formaldehyde

Formaldehyde emissions were determined using EPA Method IP-6A. Waters DNPH-Silica Sep Pak cartridges (Part number 37500, Millipore Corp.) were used to determine the concentrations of formaldehyde and other low-molecular weight carbonyl compounds in chamber air. The 2,4-dinitrophenylhydrazine (DNPH) reagent in the cartridge reacted with carbonyl compounds to form the stable hydrazone derivatives retained by the cartridge. These cartridges meet the requirements of U.S. EPA Methods TO-11 and IP-6A.

The hydrazone derivatives were eluted from a cartridge with HPLC-grade acetonitrile. An aliquot of the sample was analyzed for low-molecular weight aldehyde hydrazone derivatives using reverse-phase high-performance liquid chromatography (HPLC) with UV detection. The absorbances of the derivatives were measured at 360 nm. The mass responses of the resulting peaks were determined using multi-point calibration curves prepared from standard solutions of the hydrazone derivatives (3).

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Volatile Organic Compounds

VOC measurements were made using gas chromatography with mass spectrometric detection (GC/MS). Chamber air was collected onto a solid sorbent which was then thermally desorbed into the GC/MS. Instrumentation included a NuTech 8533 Universal Sample Concentrator, a Hewlett-Packard 5890 Series II Gas Chromatograph and a Hewlett-Packard 5970 or 5971 Mass Selective Detector (GC/MS). The solid sorbent collection media contained Carbosieve SIII, Carbotrap 20/40 Mesh, and Carbotrap C.

The multi-bed collection technique, separation, and detection analysis methodology has been adapted from techniques presented by the U.S. EPA and other researchers. The technique follows EPA Method IP-1B and is generally applicable to C_4 - C_{16} organic chemicals with boiling points ranging from 35°C to 250°C (3-6). It has a detection limit of 0.9 $\mu g/m^3$ for most individual VOCs and total volatile organic compounds (TVOC).

Individual VOCs were separated and detected by GC/MS. The TVOC measurements were made by adding all individual VOC responses obtained by the mass spectrometer and calibrating the total mass relative to toluene. Individual VOCs, if analyzed, were quantified (relative to toluene as a standard) and identified using AQS' specialized indoor air mass spectral database. Other compounds were identified with less certainty using a general mass spectral library available from the National Institute of Standards and Technology (NIST). This library contains mass spectral characteristics of over 75,000 compounds as made available from NIST, the Environmental Protection Agency (EPA) and the National Institutes of Health (NIH). A match is first sought in the AQS database, which includes data for the gas chromatographic retention time of the compound in addition to the mass spectrum. This additional information, along with the use of spectra generated on AQS equipment, makes confidence in identifications made from the AQS database higher than in identifications made using only the NIST/EPA/NIH mass spectral library.

Particles

Particle measurements were made micro-gravimetrically utilizing AQS method AN001. This technique is comparable to the NIOSH Method 0500 (7), and has a detection limit of 10 $\mu g/m^3$, based on an air collection volume of 1000 L.

AIR CONCENTRATION DETERMINATIONS

Emission rates of formaldehyde and TVOC were used in a computer exposure model to determine potential air concentrations of the pollutants. The computer model utilized the measured emission rate changes over the one week time period to determine the change in air concentrations that would accordingly occur (8).

The model measurements were made with the following assumptions: air within the open areas of the building is well-mixed at the breathing level zone of the occupied space; environmental conditions are maintained at 50% relative humidity and 23°C (73°F); there are no additional

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sources of these pollutants; and there are no sinks or potential re-emitting sources within the space for these pollutants.

QUALITY CONTROL PROCEDURES FOR ENVIRONMENTAL CHAMBER EVALUATIONS

Air Quality Sciences' quality control/assurance plan is designed to ensure the integrity of the measured and reported data obtained during its product evaluation studies. This QC program encompasses all facets of the measurement program from sample receipt to final review and issuance of reports.

One of the most critical parameters in AQS' product evaluations is the measurement of ultratrace levels of gaseous chemicals, typically in the ppb air concentration range. This necessitates a very rigidly maintained effort to control background contributions and contamination. These contributions must be significantly less than those levels being measured for statistically significant data to be obtained. AQS addresses this control in many directions including chamber construction materials, air purification and humidification, sampling materials and chemicals, sample introduction, and analysis.

Supply air purity is monitored on a weekly basis, using identical methodology to the chamber testing. The supply air is assured to contain less than 2.0 $\mu g/m^3$ TVOC, < 10 $\mu g/m^3$ total particles, and < 6 $\mu g/m^3$ formaldehyde. Preventative maintenance ensures supply air purity, and corrective action is taken when any potential problems are noted in weekly samples. Supply air filter maintenance is critical for ensuring the purity of the chamber supply air. Chamber background samples are obtained prior to product exposure to ensure contaminant backgrounds meet the required specifications prior to product exposure. Results of this monitoring are maintained at AQS and available for on-site inspection.

All environmental chamber procedures are in accordance with ASTM D 5116 and meet the data quality objectives required.

Various measures are routinely implemented in a product's evaluation program. These include but are not limited to:

appropriate record keeping of sample identifications and tracking throughout the study;

calibration of all instrumentation and equipment used in the collection and analysis of samples;

tracking of all chamber parameters including air purification, environmental controls, air change rate, chamber mixing, air velocities, and sample recovery;

analysis of spiked samples for accuracy determinations;

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duplicate analyses of 10% of all samples evaluated and analyzed;

multi-point calibration and linear regression of all standardization;

analysis of controls including chamber backgrounds, sampling media, and instrumental systems.

Precision of TVOC analyses is assessed by the relative mean deviation (%RMD) from duplicate samples, defined as the absolute value of the difference between the mean and either test value, divided by the mean. Accuracy is based on recovery of toluene mass spiked onto sorbent material. QC data on TVOC measurements conducted for the calendar year ending October 31, 1996, showed an average precision measurement of 23.0% RMD based on duplicate measurements and 98% accuracy based on toluene spikes. Performance audits have been conducted on-site at AQS by the U.S. Environmental Protection Agency for several industry test programs. They are favorable and are open for review at AQS.

Quality assurance is maintained through AQS' computerized data management system (ADM). An electronic "paper trail" for each analysis is also maintained and utilized to track the status of each sample, and to store the results.

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Released by Air Quality Sciences, Inc.
Date Prepared: November 19, 1996
AQS Project #: 02792
AQS Report #: 02792-02

TABLE 1

ENVIRONMENTAL CHAMBER STUDY PARAMETERS FOR PHIFER WIRE PRODUCTS, INC.

PRODUCT 02792-020AA

Product Description:	New Vinyl Coated Fiberglass Window Screening
Environmental Chamber:	SC2
Product Loading:	1.00 m^2/m^3
Test Conditions:	1.00 ACH 5.0% RH ± 3.0% RH 70.0° C ± 2.0° C
Test Period:	11/05/96 - 11/09/96
Pollutant Emissions Evaluated:	Total Volatile Organic Compounds Individual Volatile Organic Compounds Formaldehyde Particles
Test Description:	The product was received by AQS as packaged and shipped by the customer on October 12, 1996. The package was visually inspected and stored in a controlled environment immediately following sample check-in. Just prior to loading, the product was unpackaged and weighed. The sample was cut to the specified size and loaded into the environmental chamber on x-supports to expose both sides, and tested according to the specified protocol.

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